ABSTRACT

The projection optical system, includes:

a lens component formed of fluorite;

a lens component formed of quartz;

a first lens group including at least one lens component formed of fluorite and having a positive refractive power;

a second lens group arranged in an optical path between the first lens group and the second surface and having a negative refractive power; and

a third lens group arranged in an optical path between the second lens group and the second surface and having a positive refractive power;

wherein when the number of the lens components formed of quartz is Snum, the number of the lens components formed of fluorite is Cnum, and a numerical aperture of the second surface side of the projection optical system is NA, the following conditions are satisfied:

Snum>Cnum (1)

NA>0.75 (2).